The following is given:

$\sin 30^\circ = \frac{1}{2}$ $\cos 30^\circ = \frac{\sqrt{3}}{2}$

$\sin 45^\circ = \frac{\sqrt{2}}{2}$ $\cos 45^\circ = \frac{\sqrt{2}}{2}$

$\sin 60^\circ = \frac{\sqrt{3}}{2}$ $\cos 60^\circ = \frac{1}{2}$

$\sin 37^\circ = \frac{3}{5}$ $\cos 37^\circ = \frac{4}{5}$

$\sin 53^\circ = \frac{4}{5}$ $\cos 53^\circ = \frac{3}{5}$

$\pi \approx \frac{22}{7}$ $\sqrt{2} = 1.414$

$\sqrt{3} = 1.732$ $\sqrt{5} = 2.236$

$\sqrt{7} = 2.646$ $\sqrt{10} = 3.162$

Acceleration due to gravity = 10 m/s^2

Atmospheric pressure = 1 atm = 10^5 Pa = 760 mmHg

Density of water = 1,000 kg/m^3

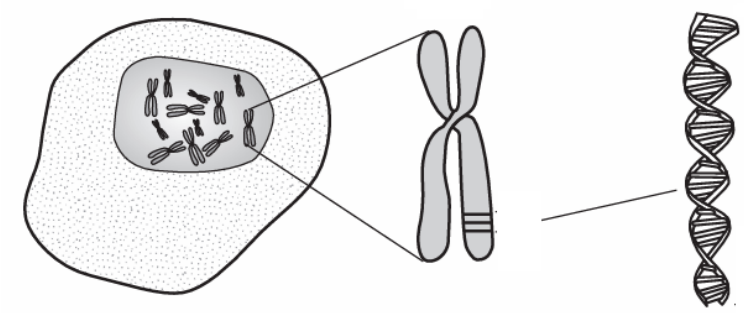
Density of mercury = 13,600 kg/m^3

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Instructions :

1. Each question carries a different score, as indicated at the end of the question.
2. Students must select only the one best answer for each question.

1. The diagram below represents a simple animal cell. A description of each cell structure is provided in the chart below.



Consider the following statements:

A. The long DNA molecule is tightly coiled many times around specialized proteins called histones.

B. Chromosome is a thread-like structure found in the nucleus that contains many units of hereditary information.

C. Ribonucleic acid is a double-stranded molecule composed of genetic material.

D. In eukaryotic cells, chromosomes are circular and located in the cytoplasm.

E. Telomeres help protect the ends of chromosomes from damage.

F. Genes are a single unit of hereditary information.

Which statements are correct? (1.25 marks)

1. A, B, E, and F
2. A, B, E, and D
3. B, C, D, and F
4. A, B, C, D, and F

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2. Which of the following statements is incorrect? (1.25 marks)

1. When light refracts, its wavelength remains the same, but its speed and frequency change according to the refractive index of the medium.

2. Fiber optics use the principle of total internal reflection.

3. Eyeglasses use the refraction of light to correctly adjust the focus of light onto the retina.

4. The speed of light in a vacuum is greater than the speed of light in a diamond with a refractive index of 2.4.

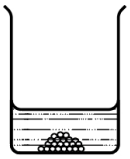
3. A $BaCl_2$ solution with concentration of 6 mol/dm³ and volume X cm³ is diluted by adding Y cm³ of water. The resulting solution has a concentration of 0.25 mol/dm³ and a total volume of 300 cm³.

Which of the following correctly states the values of X and Y? (1.25 marks)

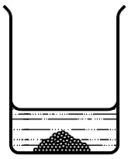
	X (cm^3)	Y (cm^3)
1.	12.5	287.5
2.	25.0	275.0
3.	37.5	262.5
4.	50.0	250.0

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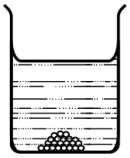
4. An experiment was conducted to investigate the rate of dissolution of substance W in solvent X. Four beakers were set up as shown below:



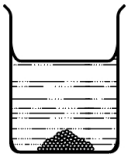
Beaker P
50 cm^3 of solvent X at 25°C
10 g of granulated substance W



Beaker Q
50 cm^3 of solvent X at 25°C
10 g of fine substance W



Beaker R
100 cm^3 of solvent X at 50°C
10 g of granulated substance W



Beaker S
100 cm^3 of solvent X at 50°C
10 g of fine substance W

Which of the following shows the correct arrangement of the beakers from the fastest rate of dissolution to the slowest rate of dissolution? (1.25 marks)

1. P, Q, R, S
2. R, P, Q, S
3. S, Q, P, R
4. S, R, Q, P

5. Which statement best describes a critical function of the placenta? (1.25 marks)

1. Meiosis occurs in the placenta, allowing for the development and release of eggs.
2. Blood from the mother and fetus mixes at the placenta, providing nutrients and oxygen.
3. The placenta filters out all harmful toxins and chemicals from the mother's blood, so that they cannot reach the fetus.
4. The exchange of oxygen and carbon dioxide occurs between the mother and developing fetus across the placenta.

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6. The study identified factors that affect soil formation, as shown in the table.

Factor	Information
Parent Material	The types of rocks that are weathered into soil
Climate	Temperature, rainfall, and humidity
Organism	Plants, animals, and microorganisms in the soil
Topography	Slope and drainage
Time	The duration of soil formation

Based on the data in the table, soil samples from a humid tropical forest on a mountainous area with many caves are dark and rich in organic matter, while soil samples from a dry limestone mountaintop are red and contain very little organic matter. Which of the following is the main factor causing the difference in soil characteristics between these two areas? (1.25 marks)

1. Topography and time
2. Climate and organism
3. Parent material and time
4. Parent material, organism and topography

7. Given an equation representing a system at equilibrium:

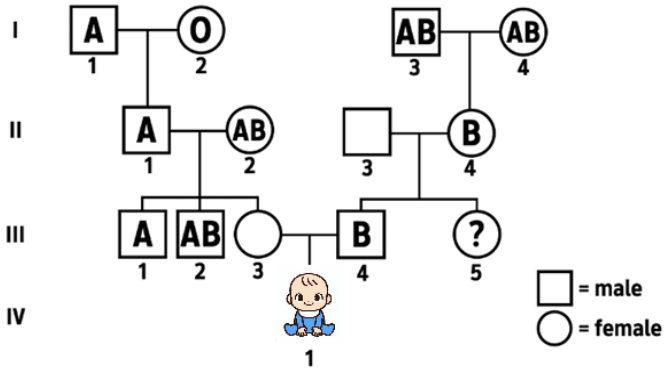
$$2SO_2(g) + O_2(g) \rightleftharpoons SO_3(g) + \text{energy}$$

Which change occurs when the temperature is increased? (1.25 marks)

1. The equilibrium shifts to the left and the concentration of $SO_3(g)$ decreases.
2. The equilibrium shifts to the left and the concentration of $SO_3(g)$ increases.
3. The equilibrium shifts to the right and the concentration of $SO_3(g)$ decreases.
4. The equilibrium shifts to the right and the concentration of $SO_3(g)$ increases.

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8. The pedigree below illustrates the ABO blood type inheritance of two lineages.



A. III-3 probably is homozygous for blood type B.

B. The probability of III-5 having a B-type blood is 50%.

C. The genotype of II-1 could either be homozygous or heterozygous.

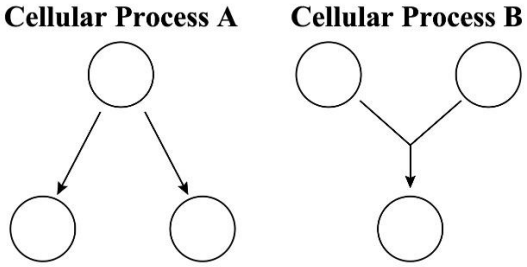
D. If III-1 is married to a woman with blood type AB, there is a chance that their child will have blood type B.

E. Baby IV-1 cannot be heterozygous.

According to the pedigree, which of the statements are correct? (1.25 marks)

1. A and B
2. B and D
3. A, B, and C
4. B, D, and E

9. The illustration below represents two cellular processes, A and B.



Select the row in the table that correctly identifies the cellular process. (1.25 marks)

	Cellular Process A	Cellular Process B
1.	meiosis	differentiation
2.	recombination	cloning
3.	fertilization	recombination
4.	mitosis	fertilization

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10. At a lake, a diver is exploring peacefully underwater. Suddenly, he hears a boat horn from directly above. At the same time, his friend who is standing on the shore 22.0 meters away from the boat horn, also hears the same sound. The horn is located at the bow of the boat, 1.5 meters above the water surface. The diver is positioned directly beneath the boat. If the speed of sound in air is 300 meters per second and 1500 meters per second in water, find the distance from the boat horn to the diver. (1.25 marks)

1. 44.5 m
2. 64.0 m
3. 102.5 m
3. 104.0 m

11. The table shows some physical properties of four minerals.

Mineral	Color	Streak	Hardness (Mohs scale)	Luster
A	colorless	white	7	vitreous
B	gold	black	6.5	metallic
C	black	black	1 - 2	metallic
D	white	white	3	vitreous

Which of the following is a correct use of minerals according to their physical properties? (1.25 marks)

1. Mineral A is used to make watch glass because it is colorless, hard, and has a vitreous luster.

2. Mineral B is used to make gold necklaces because it has a golden color, is very hard, and has a metallic luster.

3. Mineral C is used to make electrical wires because it is black, has low hardness, and has metal-like properties.

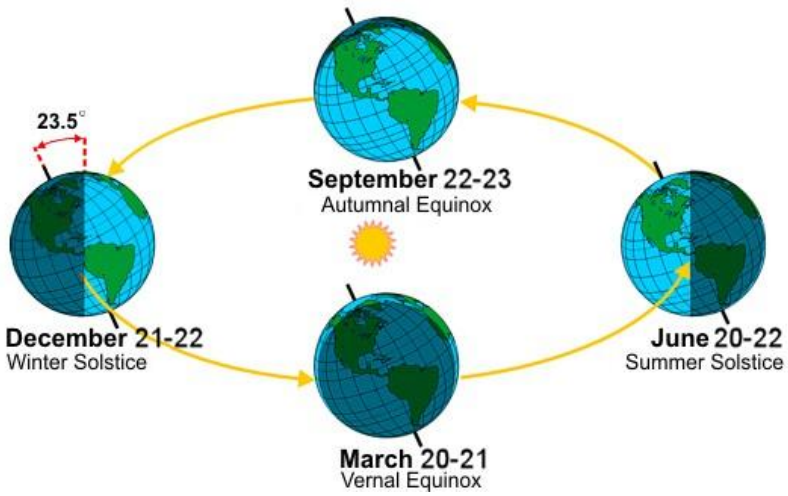
4. Mineral D is used to make jewelry because it has the same color and streak, low hardness, and a vitreous luster

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12. A 5 kg mass rests on an inclined plane at an angle of 37° to the horizontal. If the coefficient of kinetic friction between the surface of the object and the inclined plane is 0.25, what is the work done to move this object 15 m up the inclined plane with an acceleration of 2 m/s²? (1.25 marks)

1. 550 J
2. 600 J
3. 650 J
4. 750 J

13. The diagram shows the Earth's position in its orbit around the Sun on various dates throughout the year, with its axis tilted 23.5 degrees to the perpendicular to the plane of Earth's orbit.



From the above information, which of the following is a correct conclusion about the relationship between the position in the Earth's orbit and the occurrence of seasons? (1.25 marks)

1. The rotation of the Earth on its axis causes different seasons.
2. Seasons on Earth change as the size of the Earth changes in its orbit.
3. The seasons in the Northern and Southern Hemispheres always occur simultaneously and are the same
4. Seasons on Earth are caused by the Earth's axis being tilted at an angle perpendicular to the plane of Earth's orbit and the Earth's orbit around the Sun

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14. Consider the tidal phenomena that occur in coastal areas.

Spring Tide is when the highest and the lowest tide levels differ the most.

Neap Tide is when the highest and the lowest tide levels differ the least.

From this information, which of the following is correct about the relative positions of the Sun, Earth, and Moon during the Spring Tide? (1.25 marks)

1. The Moon and the Sun are the furthest from the Earth.
2. The Sun, Earth and Moon are perpendicular to each other.
3. The Sun, Earth, and Moon are aligned in a straight line
4. The position of the Sun, Moon and Earth has no effect on the formation of spring tide.

15. Potholes are circular holes that appear on the surface of rocks. They come in many sizes, ranging from small to large. Inside the holes, rocks, gravel, and sand are often found piled up at the bottom, as shown in the picture.

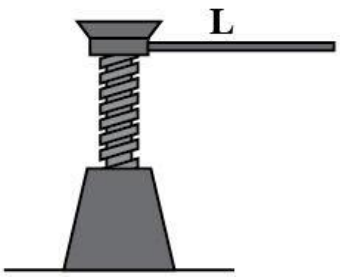


Which geological process contributes most to the formation of potholes along rock surfaces? (2.5 marks)

1. erosion
2. weathering
3. chemical weathering
4. sediment transportation

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16. The screw has a radius (L) of 35 centimeters, as shown in the figure.



If this screw has a mechanical advantage of 88, how many threads per 10 cm length does it have? (2.5 marks)

1. 2
2. 4
3. 6
4. 8

17. A river in the floodplain area has the following characteristics shown in the picture.

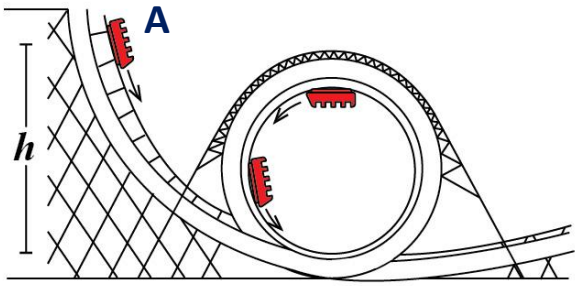


If this river continues to flow, what changes will happen? (2.5 marks)

1. An oxbow lake will develop.
2. An offset stream will develop.
3. A braided stream will develop.
4. The river will change its shape back to a straight line

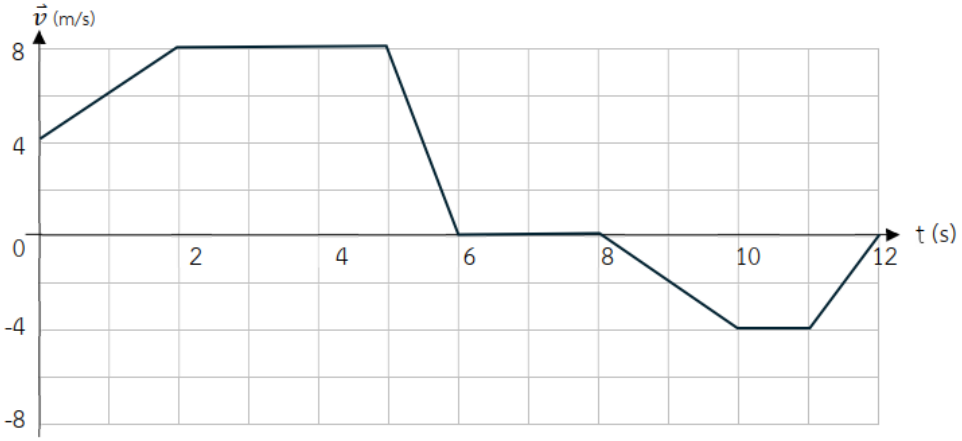
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18. You are a novice engineer hired to design a roller coaster at Miraah Amusement Park. The coaster track is frictionless, and the car starts from rest at point A, as shown in the figure. You need to design the track so that the car completes a circular loop with a radius of 30.0 meters. What should the initial height *h* be to ensure the car does not fall off the track? To minimize material costs, the height should be as low as possible (2.5 marks)



1. 60.0 m
2. 70.0 m
3. 75.0 m
4. 90.0 m

19. The velocity-time graph of an object is shown in the figure below.



What is the displacement of the object during the time interval from t=2 to t=10?
(2.5 marks)

1. 24 m
2. 32 m
3. 48 m
4. 52 m

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20. In the Olympic Games, there is a sport called curling. It is a team sport played on an ice rink. Each team takes turns sliding granite stones toward a target called the house. Two players sweep the ice in front of the stone to help control its direction and distance.



Suppose a stone with a mass of 20.0 kilograms is uniformly accelerated for 1.25 seconds before the curler releases it. Then, the stone decelerates uniformly until it comes to a stop, traveling a total distance of 35.0 meters in 17.5 seconds. Calculate the average power the curler uses to accelerate the stone. (2.5 marks)

1. 32 W
2. 64 W
3. 128 W
4. 256 W

21. Tarzan swings on a 20-m-long vine, initially inclined at an angle of 37° to the vertical. Ignoring the air resistance, what will his speed be at the point that is 80 cm higher than the lowest point of the swing if he pushes off with a speed of 6 m/s? (2.5 marks)

1. 8 m/s
2. 10 m/s
3. 12 m/s
4. 14 m/s

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22. An aluminum cube-shaped box is constructed using six aluminum sheets, each with dimensions 50x50x2 cm. These sheets are welded together to form a box with external dimensions of 50x50x50 cm. When this box is submerged in water and tied with a rope to a large rock to prevent it from floating, what is the tension in this rope holding the box underwater? The density of the aluminum is given as 3,400 kg/m^3, and the weight of the welding material is negligible. (2.5 marks)

1. 0 N (the box is submerged)
2. 230 N
3. 1,080 N
4. 2,270 N

23. A convex lens has a focal length of 10 cm. Another convex lens with a focal length of 12.5 cm is placed 25 cm to the right of the first lens. If an object is placed 30 cm to the left of the first lens, what is the distance between the final image formed by the refraction through both lenses and the object itself? (2.5 marks)

1. 5 cm
2. 15 cm
3. 25 cm
4. 50 cm

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24. Muscular dystrophy affects the functioning of skeletal muscles. As the disease progresses, it can impair the contraction of the diaphragm and the rib muscles. How will this impact the gas exchange of the patients with this illness? (2.5 marks)

1. The disease will reduce the ability to move air into and out of the lungs, resulting in decreased gas exchange.
2. The disease will have no effect on the ability to carry out gas exchange.
3. The disease will cause mucus to build up in the respiratory tract, reducing gas exchange.
4. The disease will reduce the surface area for gas exchange, therefore, decreasing gas exchange.

25. During a laboratory experiment, a student heats a beaker containing 120.0 grams of water. The table below shows the mass and the temperature of the water before and after heating.

The data for Heating Water is shown below:

Mass of 120.0 mL of water	120.0 g
Temperature of water before heating	23.0°C
Temperature of water after heating 20.0 min	86.0°C

Consider the following statements and answer the question:

A . Heat flows from the candle flame to the beaker of water.

B. The amount of heat absorbed by the water in the beaker is 31,752 joules.

C. The average kinetic energy of the molecules decreases.

D. The water molecules collide more often and with greater force as the temperature increases.

Which of the following statements is correct? (2.5 marks)

1. A and C
2. A and D
3. B, C, and D
4. A, B, and D

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26. The information describes an experiment on germination of seed. Test tubes were set up according to the details below before being tested in different conditions.

Test tube 1: Seeds placed on dry cotton wool

Test tube 2: Seeds placed on wet cotton wool

Test tube 3: Seeds placed on wet cotton wool, deoxygenated water was added, and oil was layered on top of the water

Which of the following best describes the correct outcome? (2.5 marks)

1.

Condition	1	2	3
In the dark	X	✓	X
In the light	X	✓	X

2.

Condition	1	2	3
In the dark	X	✓	✓
In the light	X	X	✓

3.

Condition	1	2	3
In the dark	✓	✓	X
In the light	X	✓	X

4.

Condition	1	2	3
In the dark	✓	✓	✓
In the light	✓	X	X

Key :

✓ = seeds germinate

X = seeds do not germinate

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27. In a climbing adventure, climbing up may be only half the challenge. The other half is "rappelling" — where the climber uses a rope and special friction devices to safely control their descent.

Suppose a climber weighs 600.0 newtons and is rappelling down a smooth cliff face (with no friction between the climber and the rock surface). While descending, the climber pushes their feet horizontally against the cliff to slightly lift away from it. At that moment, the supporting rope makes a 30-degree angle with the cliff face.

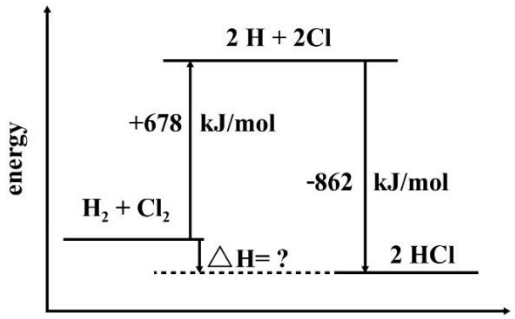


Find the tension in the rope supporting the climber's weight and the magnitude of the horizontal force the climber exerts by pushing against the cliff. (5 marks)

1. T = $200\sqrt{3}$ N Fx = $400\sqrt{3}$ N
2. T = $300\sqrt{3}$ N Fx = $600\sqrt{3}$ N
3. T = $400\sqrt{3}$ N Fx = $200\sqrt{3}$ N
4. T = $600\sqrt{3}$ N Fx = $300\sqrt{3}$ N

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28. According to the reaction H_2 (g) + Cl_2 (g) ⟶ 2HCl (g), is it endothermic or exothermic? Also, what is the total amount of energy change? (5 marks)



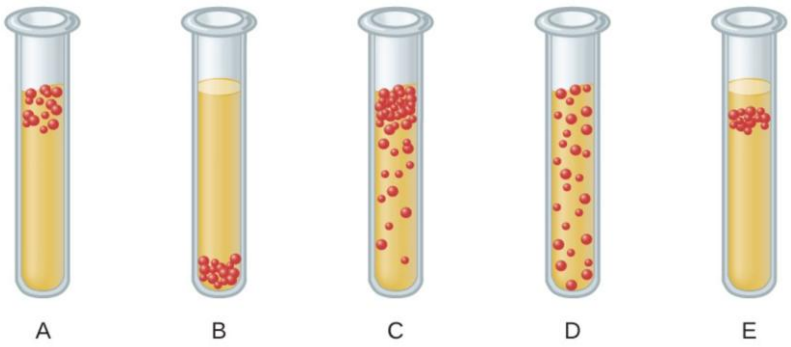
1. exothermic, +184 KJ/mol
2. exothermic, -184 KJ/mol
3. endothermic, +184 KJ/mol
4. endothermic, - 184 KJ/mol

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29. A scientist is conducting an experiment to investigate the oxygen requirements of bacteria collected from five different environments. To do this, the scientist collects bacterial samples from five different locations and inoculates them separately into five test tubes (labeled A to E), each containing a nutrient-rich broth medium (yellow fluid) that supports bacterial growth. These tubes are sealed and incubated upright under conditions that naturally generate an oxygen gradient:

- Oxygen concentration is highest at the top of the tube (near the air-liquid interface).
- Oxygen concentration decreases gradually down the tube, with no oxygen at the bottom.
- Red dots represent bacterial cells after incubation.

The incubation is carried out at 37°C for 24 hours, and the bacterial distribution is observed to categorize each sample as shown on the diagram below:



Which of the following statements best explains the observed bacterial growth patterns across the five test tubes? (5 marks)

1. The differences in bacterial positions across tubes A to E suggest that all samples grow equally well in the absence of oxygen, regardless of the initial source.
2. Since bacterial growth in some tubes occurs only in specific oxygen zones, it can be inferred that the nutrient availability varies from top to bottom in each tube.
3. The bacteria in each test tube likely differ in their response to oxygen, as shown by the distinct growth zones, even though all other growth conditions were kept constant.
4. The pattern of growth near the surface in all test tubes confirms that the oxygen level was uniformly high throughout the entire liquid column.

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30. The table below shows impacts of climate change:

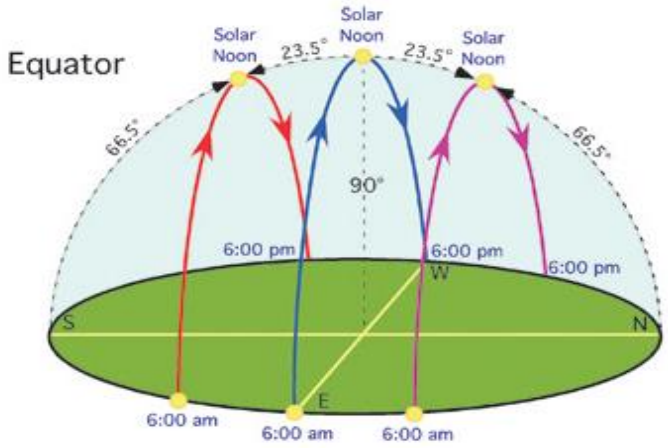
Climate change	Possible results
The global average temperature is rising	Sea level rises
Rainfall changes	Heavier and more frequent rainfalls in some areas, and longer droughts in some areas.
The intensification of storms	More severe storm surges.

City A is located on the banks of a large river in a flood plain on a river delta. City B is situated on a steep mountain top near the coast. If severe climate changes occur simultaneously, which of the following correctly predicts the disasters that would affect City A and City B? (5 marks)

1. City A experiences coastal erosion, and City B experiences a tsunami.
2. City A experiences a landslide, and City B experiences a flash flood.
3. City A experiences flooding due to overflowing riverbanks, and City B experiences a landslide.
4. City A experiences flooding due to overflowing riverbanks, and City B experiences coastal erosion.

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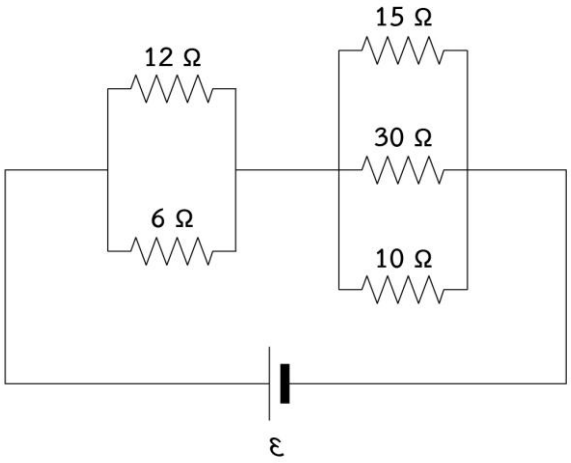
31. Path of the sun throughout the year at the equator, as shown in the picture.



If you lived in Greenland near the North Pole, what would happen in June? (1.25 marks)

1. The night is longer than the day.
2. Day and night are of equal length.
3. The sun does not set below the horizon.
4. The sun stays below the horizon all day long.

32. When the current flowing through a 12-**Ω** resistor is 2 A, what is the current flowing through a 10- **Ω** resistor? (1.25 marks)



1. 2 A
2. 3 A
3. 4 A
4. 5 A

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33. During a laboratory activity, appropriate safety equipment was used and safety procedures were followed. A student investigated the relative chemical activity of four metals by placing one piece of each metal in aqueous nitrate solutions of each of the four metals. The observations from the investigation are shown in the table below

Observations of Four Metals

Metal	Color of Metal	Compound in Aqueous Solution			
		$Cu(NO_3)_2$ (aq)	$Mg(NO_3)_2$ (aq)	$Zn(NO_3)_2$ (aq)	$AgNO_3$ (aq)
Cu	red	no reaction	no reaction	no reaction	black solid appears
Mg	silver-white	gray solid appears	no reaction	gray solid appears	black solid appears
Zn	blue-white	black solid appears	no reaction	no reaction	black solid appears
Ag	silver	no reaction	no reaction	no reaction	no reaction

The student wanted to use information from this investigation to make an operating voltaic cell using a zinc electrode and a $Zn(NO_3)_2$ (aq) solution in one of the half-cells.

A. Magnesium is the most active metal and Silver is the least active metal used in this investigation.

B. The oxidation state of nitrogen in the $AgNO_3$ solution is +3.

C. $Zn \longrightarrow Zn^{+2} + 2e^-$ is a balanced half-reaction equation for the oxidation of the zinc during this investigation.

D. Magnesium and Silver could be used as the cathode in the other half-cell in voltaic cell.

Which of the above statements are incorrect? (2.5 marks)

1. A
2. B
3. C
4. B and D

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34. Take green liquids A and B, and red liquids A and B, then perform chromatography using alcohol as the solvent, ensuring the solvent travels the same distance. The results of this experiment are shown in the table below:

Sample color	Colors found after separation	Distance travelled by the substance (cm)	R_f
Green A	Blue	10.50	0.70
	Yellow	9.30	0.62
Green B	Blue	3.00	0.20
	Yellow	9.30	0.62
Red C	Purple	3.75	0.25
	Red	18.00	1.20
	Yellow	0.00	0.00
Red D	Red	4.80	0.32

Consider the following statements and answer the question:

A. Green A and Green B are likely to be the same substance because their blue and yellow components separate in the same way.

B. The yellow component in Green A is more soluble in alcohol than the blue component in Green A.

C. The yellow compounds Green A and Green B are different substances.

D. Red D is a pure substance.

E. The R_f value of red in Red C is unlikely.

Which of the following statements is correct? (2.5 marks)

1. A, B, C
2. B, C, E
3. A and E
4. Only E

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35. An early astronomer, using a simple telescope over many years, meticulously sketched the surface of the Moon every night it was visible. The astronomer's logbook contains hundreds of drawings. When analyzing the logbook, a modern student notices a consistent pattern: regardless of the Moon's phase (e.g., crescent, half, or full), the same large craters and dark plains (maria) are always visible on the Moon's surface, and they always appear in the same relative positions. The "face" of the Moon never seems to change.
Based on this consistent observation, what can be concluded about the Moon's rotation relative to its orbit around Earth? (2.5 marks)

1. The Moon rotates much faster than it orbits Earth, creating an optical illusion.
2. The Moon rotates on its axis at approximately the same rate that it orbits the Earth.
3. The Earth's rotation speed prevents us from ever seeing the other side of the Moon.
4. Only one side of the Moon is illuminated by the Sun, so we can never see the dark side.

36. A table below compares the properties of sandstone and limestone.

Rock Type	Rock forming mineral	Hardness (Mohs scale)	Reaction with HCl acid
Sandstone	Quartz	7	No reaction
Limestone	Calcite	3	Reacts (fizzes)

If students place samples of both sandstone and limestone in an area where acid rain (slightly acidic rainwater) frequently falls, which of the following effects is expected on each rock type? (2.5 marks)

1. Sandstone will weather much faster than limestone.
2. Limestone will weather much faster than sandstone.
3. Both rock types will become harder when exposed to acid rain.
4. Sandstone will transform into limestone upon exposure to acid rain.

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37. From the study of the properties of substances x, y and z, the following data were obtained:

Substance	Characteristics	Solubility in water	Litmus paper discoloration	Conductivity
x	White solid	insoluble	Doesn't change litmus paper color	no
y	Colorless liquid	soluble	Doesn't change litmus paper color	yes
z	Yellow liquid	soluble	change blue to red	yes

Based on the experimental results, students can conclude the following:

A. Solution x does not dissociate into ions and exhibits neutral properties.

B. Substance y is a polar molecule and displays basic properties.

C. Solution z is a polar molecule and exhibits acidic properties.

D. If substances y and z are mixed together, a yellow solution will be obtained.

Which of these conclusions is correct? (5 marks)

1. A and B
2. A and C
3. B and D
4. B and C

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38. A student is investigating how glucose concentration, temperature, and pH influence the growth rate of anaerobic bacteria during fermentation. The experiment is designed using five sealed conical flasks (labeled A–E), each containing 100 mL of nutrient broth medium and inoculated with 5 mL of anaerobic bacterial culture (adjusted to OD600 = 0.10 at the start).

Each flask is set to a specific combination of glucose concentration, incubation temperature, and pH, as shown in the table below. The student measures optical density at 600 nm (OD600) at regular intervals to monitor bacterial growth. The growth rate of the bacterial population is the increase in OD600 over 10 hours.

All other variables such as flask volume, bacterial strain, nutrient composition, inoculum volume, and measurement intervals are kept constant to ensure a fair test.

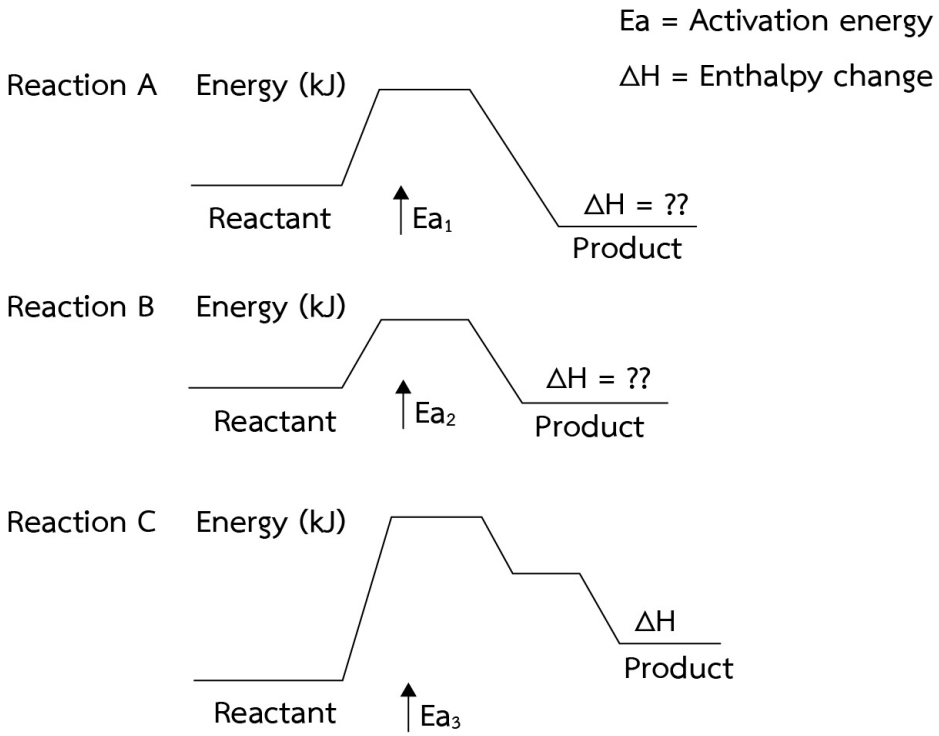
Flask	Glucose (%)	Temperature (°C)	pH	Initial OD600	Final OD600 (10 h)
A	1.0	30	6.0	0.10	0.46
B	1.0	37	6.0	0.10	0.67
C	1.0	37	7.0	0.10	0.75
D	3.0	37	7.0	0.10	0.98
E	5.0	37	7.0	0.10	0.85

Assuming all glucose is completely consumed by the bacteria during the 10-hour incubation period, which flask shows the highest bacterial growth yield per gram of glucose added?
(5 marks)

1. Flask B, because it shows the highest final OD600 among flasks with 1% glucose.
2. Flask C, because the combination of pH 7.0 and 1% glucose produced a more efficient conversion of glucose to biomass.
3. Flask D, because it has the highest final OD600 value compared to other flasks.
4. Flask E, because although it contains 5% glucose, the final OD600 is nearly twice that of Flask A.

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39. A team of student researchers from the youth research project "Green Storage Battery" is studying ways to select chemical reactions for energy storage in portable devices, such as clean energy batteries. They investigate three types of chemical reactions by measuring the energy of the reactants, products, and activation energy for each reaction. Additionally, they have constructed energy profile diagrams to visualize the energy changes of each reaction. The students summarized the data in the form of energy profile diagrams as follows:



Reaction A : Combustion of glucose in air

Reaction B : Combination of H_2 and Cl_2 to form HCl (light is used to initiate the reaction)

Reaction C : Electrolysis of H_2O (splitting water using electricity)

Based on the energy diagrams and the situations described above, which of the following statements is incorrect? (5 marks)

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1. Reaction A releases the most energy among the three reactions because the product clearly has lower energy than the reactants.

2. Reaction B has the lowest activation energy and releases a small amount of energy, making it suitable for use in light sensor systems.

3. Reaction C is an endothermic reaction, as the products have higher energy than the reactants and requires electrical energy to proceed.

4. Even though Reaction C is endothermic, it is suitable for energy storage in batteries.

40. When Austin was 20 years old, he had a deep cut on his left leg and bled profusely without forming a blood clot. Under normal conditions, when a tissue is injured, blood flows out from it and coagulates to form a blood clot. The clot prevents further blood loss and entry of pathogenic microorganisms. The blood clotting process depends on clotting factors that work in harmony with each other. Austin's blood would not clot. A condition in which a person's blood does not clot is usually found only in males, and it is a recessive gene inherited through the X chromosome. Austin's paternal grandmother is not a carrier of the recessive gene.

A. Austin's mother definitely has the ability to clot blood.

B. If Austin gets married to a normal woman who is not a carrier, the probability that they will have a son with the disease is 25%.

C. Austin's father is a carrier for this disease.

D. Austin's mother is a carrier for this disease.

Which of the above statements are correct? (5 marks)

1. A and B
2. B and C
3. A and D
3. A, B, and D

---------- End of Questions ----------

Please check your answers before submitting the answer sheet.

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คำตอบวิชาวิทยาศาสตร์ ชั้นมัธยมศึกษาปีที่ 3

ข้อ	คำตอบ	ข้อ	คำตอบ
1	1	21	2
2	1	22	2
3	1	23	1
4	4	24	1
5	4	25	4
6	2	26	1
7	1	27	3
8	2	28	2
9	4	29	3
10	3	30	3
11	1	31	3
12	4	32	2
13	4	33	4
14	3	34	4
15	1	35	2
16	2	36	2
17	1	37	2
18	3	38	2
19	1	39	4
20	3	40	3

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